DOCUMENT RESUME

ED 208 709 HE 014 293

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TITLE Analyzing the Cost Efficiency of Academic Departments and Instructional Personnel at State Universities.
PUB DATE [81]
NOTE 16p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Accounting; *College Planning; *Cost Effectiveness; *Departments; Efficiency; Higher Education; Income; Instructional Student Costs; Models; Productivity; *Program Costs; *Program Development; *Teacher Salaries

ABSTRACT

A cost-effectiveness model is presented for academic administrators to use in making evaluation and planning decisions related directly to the instructional activities of academic departments. The advantages seen in the model are that it is simple and flexible, concentrates on balancing income generated by the department to expenses incurred, and encourages careful fiscal management. It uses information currently being produced but not reported, and takes into account user feedback. Only instructional revenue and operating costs are considered. Model components include: (1) an instructional personnel profit or loss statement, which takes into account teaching activities (measured in student full-time-equivalents and representing direct revenues) and salaries (direct costs) of each faculty member; and (2) the departmental instructional profit or loss statement comparing totals in four categories of instructional revenues (faculty and support position salaries, operating funds, program improvement funds, and equipment funds) to the corresponding four categories of actual expenditures. By carefully analyzing these components the department may choose to increase revenues, decrease expenses, or do both. The administrator may also use the information to enhance his or her understanding of the department mission, its relationship with other departments, and any other pertinent information to increase the knowledge base for decision-making. (MSE)

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ANALYZING THE COST-EFFICIENCY OF ACADEMIC DEPARTMENTS AND INSTRUCTIONAL PERSONNEL AT STATE UNIVERSITIES

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The purpose of this article is to give academic administrators a cost-efficiency model designed to provide a basis for evaluation and planning decisions related directly to the instructional activities of academic departments. The model includes a component designed to calculate the "profit or loss" generated by each member of the teaching faculty and a component designed to calculate the "profit or loss" of the academic department.

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ANALYZING THE COST EFFICIENCY OF ACADEMIC DEPARTMENTS AND INSTRUCTIONAL PERSONNEL AT STATE UNIVERSITIES

During the past two decades there has been an increasing demand for the services provided by information systems. The world of microcircuitry, with networks of computers which transmit data at nearly the speed of light, is generating information at an explosive rate. Administrators of organizations in this environment expect precise, accurate, and timely information. This information is used for record-keeping as well as for decision making, using such techniques as operations research, econometrics, systems analaysis, and PPBS (Program, Planning, and Budgeting Systems). Such information has been used successfully in business and industry in situations similar to those arising in educational institutions. Consequently, it is postulated that the performances of educational institutions could be upgraded by the use of properly designed and properly implemented information systems.

There is evidence that information systems contribute to higher profits (resulting from efficiency) and greater effectiveness. Thus, there is a demand from legislatures that such systems be used in education. Since the founding of the Boston Latin School in 1635, the education industry has evolved into the nation's largest industry. Expenditures for education have increased more than forty percent in the last decade. With other demands for public funds, it appears that the future supply of resources will be relatively less than the demand for them in education. Therefore, this situation will require more effective methods of running educational institutions, thereby increasing the need for efficient information systems such as those that have proved so successful in government and industry.

Most educational institutions have systems which provide information upon which administrators base decisions. One of the most common is the

institutional cost study. Many of these studies provide program, planning, budgeting, and evaluation information. Included in such studies is a compilation of information about the institution's costs, as well as other descriptive characteristics of a non-financial nature such as course load data and faculty activity analyses. However, the information is provided in terms of general program costs. The problem is that most cost studies do not include an evaluation of the cost-efficiencies of individual academic departments or individual instructional personnel. Therefore, University administrators have no means of evaluating the efficiencies of these basic units of the university organization.

Departmental and higher-level administrators need a model framework upon which to structure and base decisions regarding the effectiveness and efficiency of departmental activities. Such a decision network is an important asset in insuring the sound financial and economical operations of a department. This is especially true when departmental administrators are considering the addition of new programs or personnel or contemplating more emphasis on research than on teaching or vice versa. The same is also true if a reduction in programs or personnel is contemplated. The well established tool of cost-efficiency analysis can provide an expeditious approach to solving such an array of problems.

The availability of cost information and analyses are pertinent in the management of institutional affairs. However, the management staffs of today's higher education institutions are so specialized that only research directors and budget directors have insights into cost data. Academic department chairpersons and higher-level decision-makers receive very little data as it pertains to departmental and faculty efficiency.

What help can academic decision-makers expect in developing better

bases on which to make fiscal decisions? The Education Commission of the States, the National Center for Higher Education Management Systems, the National College and University Business Officers Association, the Association of American Universities, and countless universities and colleges have collaborated in examining the need in higher education for management tools and have attempted to develop broad procedures. The efforts of NCHEMS in developing instructional cost analyses and simulation techniques through their Information Exchange Procedures (IEP) and Resource Requirements Prediction Model (RRPM) are notable examples. Unfortunately, many of these large-scale simulation systems have not been widely utilized because they are large, complex, expensive, inflexible, and slow systems. They do not provide the timely information needed to deal with the ambiguous and quickly changing decision needs of today's administrators.

In order to develop useful cost analysis information, close attention must be paid to tailoring the system to the individual administrator's needs. Management-oriented administrators use thorough analyses of income and expenses in their decision processes while administrators who may not be so analytical may be content with very simple analyses that are used to identify potential trouble spots.

Varying administrative styles, increasingly short administrative tenures, and important differences in the types of decisions to be made all argue for flexible and adaptable analysis systems. The need to make timely decisions with limited information suggests that it is not large, elaborate computational schemes that are needed at universities, but small, easily modified systems that can produce selective, concise, and well-focused reports.

The construction of simple and flexible cost analysis systems designed

primarily with the decision needs of the unit managers in mind should encourage sound and consistent management at all levels within the institution. These systems should have the compatability to aggregate the results of such studies for the decision-making needs of higher administrators within the institution. Such a system philosophy should encourage the unit managers to become familiar with the fiscal data available within the institution and to use it effectively in unit management.

The Cost-Efficiency Model presented in this article has the desirable characteristics listed above. It gathers and presents data to department level administrators as bases for making decisions. It is simple and flexible. It concentrates on balancing income generated by the department to expenses incurred by the department. Its concept is straightforward: to encourage careful fiscal management so that the departments, and the university as a whole, may become more efficient.

This type model is referred to by Bacchetti as the Feedback Model. The objective of the feedback approach is to develop, use, and evaluate costing information and then to alter and improve its approach on the basis of feedback from the users. This Model was designed primarily to present information which is routinely produced now. It retrieves and reports information that is currently produced but not reported. It is anticipated that as the users become familiar with all aspects of the information presented, they will request additional information. By using this approach to model development, the model will continue to change as it is responsive to the feedback from its users.

This Cost-Efficiency Model was designed to provide a basis for evaluation and planning decisions related directly to the instructional activities of academic departments. Therefore, only instructional revenue

generations and instructional operating costs are considered. The costs of activities other than instruction and direct instructional support are not considered.

One premise of this study is that the university's administrative staff compiles much valuable information about the instructional activities of academic departments. However, during the aggregation of program data for Program, Planning, and Budgeting Systems (PPBS) and other reporting activities, the value of much of this data is lost. Therefore, the collection of data consists of retrieving basic information from the source documents of the accounting and reporting systems. A series of five data-collection worksheets is used to build the data base. The results of the cost-efficiency study are presented in components, as follows:

Model Component I: Instructional Personnel Profit or Loss Statement

Faculty productivity and faculty activity are very important aspects of academic life in today's universities. In terms of business theory, the faculty member and his activities comprise the basic revenue and cost center of the university organization. Therefore, the first unit to be presented is the basic university unit, herein called the faculty member and his activities.

The measure of efficiency in this component of the Model is the profits or loss statement. The purpose of the Instructional Personnel Profit or Loss Statement is to measure the difference between the salary dollars generated by the faculty member's teaching activities (direct revenues) and the salary cost related to that faculty member (direct costs).

This statement presents teaching and salary related information about each faculty member who taught during the academic year. Columns two, three, and four summarize the average quarterly FTE students taught by each faculty member (as listed in column one). Column five presents the faculty

STATEMENT OF INSTRUCTIONAL PERSONNEL PROFIT OR LOSS FOR THE DEPARTMENT OF A
FOR THE ACADEMIC YEAR 1979-1980

Faculty Name (1)	Average Quarterly Grad. FTE's Taught (2)	Average Quarterly Under. FTE's Taught (3)	Total Average Qtrly. FTE's Taught (4)	Instructional Salary Dollars Generated (5)	Cost Salaries Paid (6)	Salary Generation Surplus or (Deficit) (7)	% of Actual Salary Generated (8)
Professor #1	2.50	6.58	9.08	$ 9,083	$ 33,019	$(23,936)	27.5%
Professor #2	.00	1.42	1.42	1,246	2,664	(1,418)	55.0%
Asst. P. & Chmn. #3	.31	.42	.73	779	1,570	(791)	49.6%
Assoc. Prof. #4	17.81	14.00	31.81	35,793	31,421	4,372	113.9%
Assoc. Prof. #5	10.00	7.25	17.25	19,558	22,796	(3,238)	85.8%
Assoc. Prof. #6	.00	.08	.08	73	460	(387)	15.9%
Asst. Prof. #7	1.56	23.58	25.14	22,792	24,363	(1,571)	93.6%
Instructor #8	.00	10.17	10.17	8,938	4,758	4,180	187.9%
Adj. Instr. #9	.00	5.42	5.42	4,763	647	4,117	736.2%
Adj. Instr. #10	.94	2.67	3.61	3,581	1,800	1,781	198.9%
Adj. Instr. #11	.00	5.92	5.92	5,200	1,500	3,700	346.7%
Adj. Instr. #12	.00	4.83	4.83	4,248	1,500	2,748	283.2%
Adj. Instr. #13	.00	1.75	1.75	1,539	450	1,089	342.0%
TOTALS	33.12	84.09	117.21	$117,593	$126,947	$(9,354)	92.6%

Note: This statement of the profit or loss status of instructional personnel in your department was prepared for your use as a decision-making tool.

salary dollars generated for the university by each faculty member. Column six displays the actual cost of the instructional faculty salary of each faculty member. Column seven presents the difference in columns five and six, the salary generation surplus or deficit. This figure represents a measure of the efficiency of each faculty member and his teaching activities in generating salary dollars equal to or in excess of his salary cost. Column eight presents a percentage display of how much of his salary cost (for teaching) each faculty member generated.

The major purpose of this statement is to point out the efficiency of each faculty member in generating enough revenues to pay the portion of his salary related directly to instruction. The statement indicates that the faculty as a group generate enough revenues to pay only 92.6 percent of their salary costs. The individual faculty generations range from a dollar surplus of $4,372 for Associate Professor #4 to a dollar deficit of $23,936 for Professor #1. Only two of the full-time faculty generated enough revenues to exceed their salary costs. The part-time instructors generated enough salary revenues to exceed their salary costs by two to seven times. The most significant item presented on this statement is that Professor #1 generated a salary deficit of almost $24,000. Comparatively, Professor #1's record of FTE students taught is very low. Consideration could be given to the possibility of Professor #1's teaching an undergraduate course (which has a high enrollment) as part of his regular teaching assignment, thus increasing his generation of funds.

The implication here is that the teaching assignments should be reviewed for possible realignment. For example, if the teaching assignments of Adjunct Instructors 10, 11, 12, and 13 had been assigned to the other faculty members, the department would have reached the efficiency point

where salary dollars generated equaled or exceeded costs.

Model Component II: The Departmental Instructional Profit or Loss Statement

The Departmental Instructional Profit or Loss Statement was designed to present the revenues generated by the instructional activities of the department and the costs attributable to the instructional activities of the department. The statement compares the totals of four categories of instructional revenues generated to the four categories of expenditures. The result of this comparison is the department's profit or loss as related to instructional activities.

It should be noted at this point that actual faculty salary dollars and actual operating expense dollars may be allocated to departments in different ways. For example, faculty salary allocations are usually based on the actual faculty contract amounts plus fringe benefits. Operating expense allocations, however, may be based on the "current rate" method where an inflationary factor is added to last year's allocation. There are several other common methods of allocating operating funds. However, this Cost Efficiency Model ignores the method of actual allocation to the departments. Instead, it compares the actual generation of funds for the university to actual costs of instruction within the department.

STATEMENT OF INSTRUCTIONAL PROFIT OR LOSS
FOR THE DEPARTMENT OF Department A
FOR THE ACADEMIC YEAR 1979-1980

The purpose of this statement is to present the revenues generated by the institutional activities of the department and the costs attributable to the instructional activities of the department. It was prepared for your use as a decision-making tool for planning and evaluating the instructional activities of your department.

Revenues generated by instructional activities:			
	Faculty instructional salaries	$117,593	
	Support position salaries	15,711	
	Operating expenses	9,153	
	Program improvement expenses	895	
	Equipment replacement	409	
	Total instruction related revenues		$143,761
Less:	Actual costs of instruction:		
	Faculty instructional salaries	$126,947	
	Support position salaries	21,081	
	Operating expenses	8,439	
	Equipment costs	499	
	Total instruction related costs		$156,966
Equals:	Departmental instructional profit or (loss) (Excess of revenues generated over actual costs incurred)		($ 13,205)

This statement presents the revenues generated by the instructional activities of the department compared to the costs of the instructional activities of the department. The result of the comparison is the department's profit or loss, as related to instruction. Department A had a loss of $13,205. To pinpoint the areas creating the loss, revenues and costs must be compared by category. For example, faculty salary revenues generated equaled $117,593, while faculty salary costs equaled $126,947, for a loss of $9,354. The comparison may be displayed by category as follows:

	Revenue Generation		Cost		Profit/(Loss)
Faculty Salaries	$117,593	-	$126,947	=	($ 9,354)
Support Salaries	15,711	-	21,081	=	(5,370)
Operating Expenses	10,048	-	8,439	=	1,609
Equipment Replacement	409	-	499	=	(90)
Totals	$143,761	-	$156,966	=	($13,205)

This analysis indicates that the "loss" was caused by the two salary categories, faculty salaries and support salaries. Possible corrections for the faculty salary loss were presented in the prior section. Further investigation indicates that Department A has two full-time secretaries (a secretary IV and a secretary III). Consideration may be given to reducing one of the secretary positions to half-time, reclassifying it to a lower paying classification such as clerk-typist, or even elimination of the position. This is not necessarily a proposal to fire or otherwise remove an employee. Normal attrition or a possible trade of positions with another department may solve the problem. It is apparent that action is needed for this category to reach efficiency.

The operating expense and equipment replacement categories are

achieving the desired efficiency status. Therefore, further analysis of these categories is not necessary.

The profit or loss statements for the instructional personnel and the department indicate that the instructional activities of the department did not generate enough revenues to pay the instructional costs. In such a finacially losing situation there are three basic methods of achieving a better financial position. The department may increase revenues, reduce costs, or some combination of the two. In order to increase revenues, the department must teach more students. To reduce costs, the department must determine areas where expenditures may be reduced or eliminated without reducing the quality of programs offered. The third alternative, increasing revenues while decreasing costs, may be the most appropriate. As the chairperson of Department A reviews the Cost-Efficiency Statements he may pinpoint areas where additional revenues may be generated, such as additional course offerings at the off-campus centers or on the main campus during different time blocks. He may also note areas where costs may be reduced, such as realignments of teaching assignments and the reduction of costs for adjunct instruction. The challenge to the chairperson of Department A is to establish an eclectic plan of operations for his department.

The Cost-Efficiency Model described in this article provides a portion of the data base on which departmental administrators may make decisions. It is recommended that those who wish to use such information should develop such a data base and then customize further developments to facilitate the fulfillment of local needs and desires. Administrators may add the information presented in these statements to their knowledge of the mission of the department, the department's relationship with other departments, and other pertinent information not presented in this study to

form a knowledge base for evaluating and planning decisions. As administrators review the Cost-Efficiency Statements they may note areas where further study will be needed. The new awareness complies with the purpose of generating increased awareness of academic departmental and faculty cost-efficiency to provide an improved basis for decision-making.

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